

601-R-750 GUARDRAIL

(Revised 12-16-22)

The Standard Specifications are revised as follows:

SECTION 601, BEGIN LINE 3, DELETE AND INSERT AS FOLLOWS:

601.01 Description

This work shall consist of the fabrication, assembly, and installation of guardrail, *guardrail components*, guardrail transitions, and guardrail end treatments, and *impact attenuators*, all in accordance with ~~these requirements, and as shown on the plans~~ 105.03. This work may also consist of the extension of existing guardrail with new guardrail, the removal of existing guardrail, or adjusting the height of existing guardrail.

MATERIALS

601.02 Materials

Materials shall be in accordance with the following:

Alternate Material Blockouts	926.03
<i>Guardrail Accessories, Fittings, and Fasteners</i>	910.11
<i>Guardrail and Guardrail Components</i>	910.09
Guardrail Posts	910.10
Rail Accessories, Fittings, and Hardware	910.11
Steel Thrie-Beam Rail	910.09
Steel W-Beam Rail	910.09
Timber Posts and Blockouts	911.02(f)

~~All guardrail, post, accessories, fittings, and hardware shall be supplied from a manufacturer listed on the QPL of Guardrail Manufacturers in accordance with 910.09. Guardrail end treatments shall be selected from the QPL of Guardrail End Treatments in accordance with 601.07. and i~~Impact attenuators shall be selected from the QPL of Impact Attenuators in accordance with 601.08.

PCC in anchors and in pads or bases for impact attenuators shall be class A and in accordance with 702. Sheet signs and sign posts shall be in accordance with 802.

Barrels used in impact attenuators shall be yellow with black lids. The coarse aggregate used in the barrels shall be size 93PG, class F or higher, in accordance with 904.

All other impact attenuators shall have end reflectorization as shown on the plans or attached to the nose of the attenuator in accordance with the attenuator manufacturer’s recommendation.

~~Thrie beam guardrail elements shall be steel and shall be in accordance with the applicable requirements for steel beam guardrail shown in 910.09, 910.10, and 910.11.~~

W-beam or Midwest Guardrail System, MGS, W-beam guardrail, components, assembly, post spacing, post lengths, and installation for each location shall be as shown on the plans. Double-facing of the guardrail will be required at the locations shown on the

plans. For W-beam guardrail, in locations where conditions will not allow the use of 7 ft posts, 6 ft posts may be substituted when approved. Timber posts may be used within a run of MGS W-beam guardrail as shown on the plans. Timber posts shall not be used within a run of W-beam guardrail.

The base metal thickness of the steel W-beam rail element for a curved guardrail system shall be 0.105 in. The base metal thickness of the steel W-beam terminal connector shall be 0.1385 in. The controlled released terminal, CRT, timber breakaway posts shall be S4S timber and shall otherwise be in accordance with 911. The curved rail timber posts shall be in accordance with 911. All structural tubing shall be in accordance with ASTM A500. The remaining steel components shall be in accordance with 910.

SECTION 601, BEGIN LINE 139, DELETE AS FOLLOWS:

601.07 Guardrail End Treatments

Guardrail end treatments shall ~~be required to terminate~~ guardrail installations at the locations shown on the plans. The type I guardrail end treatment shall be either as shown on the plans, or shall be selected from the QPL of Guardrail End Treatments. The type II guardrail end treatment shall be as shown on the plans. The type OS or MS guardrail end treatments shall be selected from the QPL of Guardrail End Treatments. The grading requirements shall be as shown on the plans.

SECTION 910, BEGIN LINE 559, DELETE AND INSERT AS FOLLOWS:

910.09 Guardrail and Guardrail Components

Guardrail of the same type shall be interchangeable regardless of the source. Guardrail materials shall be in accordance with the applicable AASHTO or ASTM requirements listed herein. ~~and will only be accepted~~ *W-beam rails, thrie-beam rails, and backup plates shall be furnished from qualified manufacturers on the QPL of Guardrail Manufacturers. Qualification requirements for the manufacturers shall be in accordance with ITM 806, Procedure O.*

~~Steel beam rail shall be galvanized, corrugated sheet steel beams in accordance with AASHTO M 180 as modified herein. The rails, including terminal sections, shall be either class A, base metal nominal thickness of 0.105 in., 12 gauge, or class B, base metal nominal thickness or 0.135 in., 10 gauge. They shall be type 2, zinc coated with 3.60 oz/sq ft minimum single spot and 4.00 oz/sq ft minimum triple spot~~ *W-beam and thrie-beam rails and backup plates shall be manufactured from corrugated sheet steel in accordance with AASHTO M 180. End sections, buffer end sections, transitions, terminal connectors, and shoes shall be manufactured from sheet steel in accordance with AASHTO M 180. All items listed above shall be galvanized in accordance with AASHTO M 180 and as modified herein. The base metal nominal thickness shall be either: class A, nominal thickness of 0.105 in., 12 gauge, or class B, nominal thickness of 0.135 in., 10 gauge, unless otherwise noted on the plans. They shall be zinc-coated, type II. Tests for adherence of the coating may be made including the test specified in ASTM A123, when deemed necessary. A type C certification in accordance with 916 shall be provided for the end sections, buffer end sections, transitions, terminal connectors, and shoes. The heat number, part number, quantity, and purchase order number of the various guardrail component items listed in the sentence above that are being furnished to the contract shall accompany the type C certification. A copy of the mill certificate and mechanical test results from the various items, if tests were ran, shall also be included.*

Where beam rail is set on a curve of 150 ft radius or less, the rail plate shall be shop curved with its traffic face concave or convex as required. The radii of curvature shall be in increments of 10 ft from a radius of 150 to 50 ft inclusive and in increments of 5 ft from a radius of 50 ft to and including 20 ft.

The steel channels specified on the plans shall be standard 5 in. channels weighing 6.7 lb/ft. The material shall be in accordance with ASTM A36. The channel shall be galvanized in accordance with ASTM A123 after fabrication. The weight of zinc coating per area of actual surface shall average not less than 2 oz/sq ft for any individual piece of channel.

Construction details for the rails and channels shall be as shown on the plans.

Whenever field fabrication, as approved, requires cutting or drilling, the cut or drilled member shall be coated ~~with a high zinc dust zinc oxide paint in accordance with Federal Specification TT P 641, type II, or Military Specifications DOD P 21035. When spray paints are used, two coats shall be applied~~ *in accordance with 910.11(a)4.*

SECTION 910, BEGIN LINE 591, INSERT AS FOLLOWS:

910.10 Guardrail Posts

Guardrail posts shall be either steel or timber as specified and shall be in accordance with the following requirements. *A type C certification in accordance with 916 shall be provided for the guardrail posts. For steel posts, a copy of the mill certification, the heat number, quantity, and purchase order number for the posts shall accompany the type C certification. Mechanical test results, if tests were run on either post material type, shall also be included.*

SECTION 910, BEGIN LINE 615, DELETE AND INSERT AS FOLLOWS:

910.11 Guardrail Accessories, Fittings, and HardwareFasteners

These items consist of brackets, splice plates and bars, post anchors, diaphragms, clamps and clamp bars, end caps, connections, anchor rod assemblies, deadmen, bolts, screws, nuts, washers, and blockouts of the type, dimensions, and design shown on the plans. They shall be in accordance with the requirements set out below. Items of the same type shall be interchangeable regardless of the source. *A type C certification in accordance with 916 shall be provided for all accessories, fittings, and fasteners.*

(a) For Steel Beam Guardrail

1. Post brackets, bars, plates and shapes for bridge railing brackets, and plate washers shall be in accordance with ASTM A36. Post brackets, bars, and plates and shapes for bridge railing brackets shall be galvanized in accordance with 910.10(a). Plate washers shall be galvanized after fabrication in accordance with ASTM A153. The weight of the W6 x 15 post bracket shall be in accordance with 910.10.
2. Splice plates and rail portion of bridge railing brackets shall be *type II*, class B, ~~type 2~~, in accordance with ~~the first paragraph of 910.09(a)~~.